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The authors have indicated no significant interest with commercial supporters.

## A Comparison of Reticle Size to Determine Follicular Unit Density in Hair Restoration

The overarching goal of hair transplantation surgeries in patients presenting with androgenic alopecia is to maximize coverage in the region(s) of hair loss by redistributing hair mass from the donor region without compromising coverage in that region. Consequently, the long-term outcome of the procedure is largely dependent on the hair loss pattern at presentation (i.e., the patient's Norwood Classification)<sup>1</sup> and the properties of the hair within the donor region. Although factors such as hair and skin color, hair curl, and the age at which hair loss began may be determined by routine visual assessment and review of patient history, the more significant predictive factors (i.e., hair diameter, follicular miniaturization, follicular unit [FU] density, and hair density)<sup>2</sup> must be measured with specialized tools during physical examination. Unfortunately, standardized methods for determining these values are either nonexistent or too time- and labor-intensive to provide reliable data; therefore, the purpose of this work was to evaluate 3 reticle sizes (1.0, 0.5, and 0.1 cm<sup>2</sup>) for follicular density quantification to determine if the reduced area offers equivalent donor assessment to that of the 1.0 cm<sup>2</sup> gold standard while improving reliability in complex donor regions.<sup>3</sup>

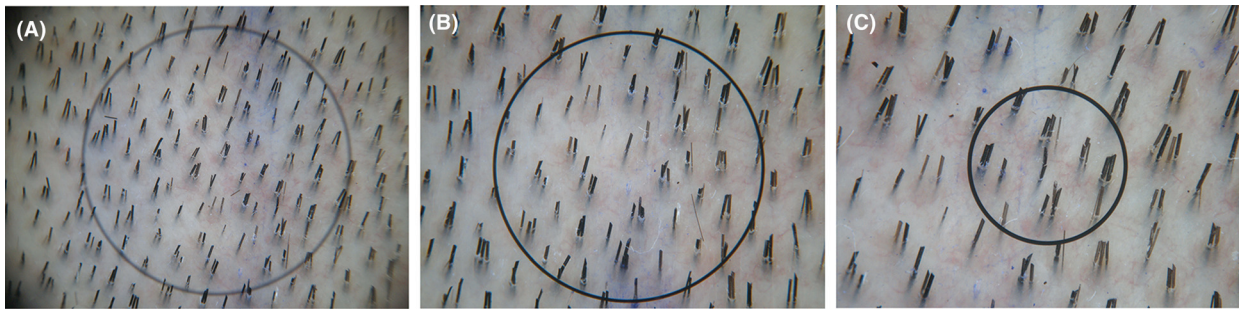
### Experiment

#### Participants

Follicular unit measurements were obtained from 40 randomly selected male patients between the ages 23 and 50 (average, 34 ± 7) years across a range of ethnicities (67.5% white, 12.5% Asian/non-Indian, 10% Middle Eastern, 5% Hispanic, and 5% Asian/Indian). Only scalps without previous surgical procedures were considered. All participants had given informed consent.

#### Calculation of Follicular Unit Densities

Photographs were taken at 3 magnification levels of the area 7.5 cm lateral to the central point of the donor region between the occipital protuberance and 3.0 cm above the auricle with the head in the transverse horizontal plane for all patients using a dermatoscope attached to a basic point-and-shoot camera. The boundary for the reticle size under investigation (1.0, 0.5, or 0.1 cm<sup>2</sup>) was demarcated with a black line, and FUs within that area were circled and numbered individually. Follicular units positioned directly on the black line or beyond were not considered. Individual



**Figure 1.** Scalp surface areas measuring (A) 1.0 cm<sup>2</sup>, (B) 0.5 cm<sup>2</sup>, and (C) 0.1 cm<sup>2</sup>.

FUs were difficult to distinguish in high-density donor regions, therefore high and low estimates were made. Follicular unit densities were calculated for the high and low estimates at each reticle size by dividing the number of FUs by the area in which they were counted. Values are reported as mean  $\pm$  standard deviation ( $n = 40$ ).

### Statistical Analysis

Repeated-measures analysis of variance ( $\alpha = 0.05$ ) was conducted to compare FU densities of the 40 patients. Two within-factor variables were incorporated: reticle size (1.0, 0.5, or 0.1 cm<sup>2</sup>) and follicular estimate type (high or low). The null hypotheses were that no difference in mean follicular density exists and that reticle size has no significant interaction with the follicular estimation type.

### Results and Discussion

Follicular unit density, hair density, and calculated density (the mean number of hairs per FU) are critical pre-operative hair restoration measurements because they allow the physician to estimate the number of grafts, the total number of hairs, and the average number of hairs per graft that can be transplanted in a given procedure and ultimately determine the suitability of a patient for hair transplant surgery. For example, a patient who presents with 100 hairs per square centimeter and a high FU density of 100 FU/cm<sup>2</sup> would have a calculated density of 1.0 hairs/FU. However, the average strip surgery produces 2.14 to 2.28 hairs per graft, and the average FU extraction generates 2.93 hairs per graft,<sup>4,5</sup> making this patient a poor candidate for hair transplantation despite his high FU density.

Given the substantial utility of density measurements in predicting the outcome of a hair restoration, any technique that reduces the time a physician must spend determining these values without compromising the integrity of the data would be highly advantageous. One such method for improving FU density measurements would be to reduce the reticle size in which FUs are counted from the 1.0 cm<sup>2</sup> gold standard. As shown in Figure 1A, 1.0 cm<sup>2</sup> reticle may contain 50 to over 100 FU and demands that a photograph be taken of the area for an accurate count to be made. When the reticle size is reduced to 0.5 cm<sup>2</sup> (Figure 1B), the count clearly decreases but still cannot be made without the aid of a photograph. However, at 0.1 cm<sup>2</sup> (Figure 1C), FUs may be counted much faster and without the aid of a photograph (i.e., they may be tallied directly on the patient's scalp).

**TABLE 1. Descriptive Statistics for Follicular Unit Measurements**

Reticle Size/Estimate Type	Mean	SD
0.1 cm <sup>2</sup>		
Low	83.5	15.1
High	88.0	15.7
0.5 cm <sup>2</sup>		
Low	84.9	13.4
High	88.5	14.0
1.0 cm <sup>2</sup>		
Low	83.3	11.9
High	86.0	12.6
Aggregated reticle sizes		
Low	83.9	0.9
High	87.5	1.3

SD, standard deviation.

The results from our analysis shown in Table 1 further indicate that reducing reticle size below 1.0 cm<sup>2</sup> does not negatively impact the quality of the data. Indeed, no significant differences were observed in mean FU densities as a function of reticle size. Moreover, high and low FU estimates were statistically similar regardless of reticle size, indicating that the accuracy of follicle counts made from the 0.1-cm<sup>2</sup> reticle is on par with that of those made from the time- and labor-intensive 1.0-cm<sup>2</sup> reticle. Therefore, we recommend that the gold standard reticle size for calculating FU density be decreased from 1.0 to 0.1 cm<sup>2</sup> to reduce the time required to obtain this critical value and simplify the laborious counting process in complex donor regions. If a 10-fold reduction in reticle size is promoted, more physicians may be motivated to include this measurement in their pre-operative patient assessment, allowing them to more accurately predict a patient's long-term hair restoration outcome.

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## **Eccrine Angiomatous Hamartoma: Successful Treatment With Pulsed Dual-Wavelength Sequential 595- and 1,064-nm Laser**

Eccrine angiomatous hamartoma (EAH) is a rare cutaneous benign proliferation that combines eccrine and vascular elements.<sup>1</sup>

The usual clinical presentation of EAH is solitary, painful, erythematous plaques or nodules, some of which have a verrucous surface and angiomatous appearance. This condition usually appears during early childhood, and congenital cases are common, although a wide range of ages has been described.<sup>1</sup>

Eccrine angiomatous hamartoma is generally slow growing, commensurate with the growth of the patient, and it is typically asymptomatic. Treatment may be required in cases that present with pain, focal hyperhidrosis, or unpleasant aesthetics. Surgical

excision is considered curative, and to date, laser treatment has been considered unsatisfactory.

The authors report 2 cases of the successful laser treatment of EAH using the combined sequential application of a pulsed dye laser (PDL) and a neodymium-doped yttrium–aluminum–garnet (Nd:YAG) laser (Cynergy; Cynosure Inc., Westford, MA). To the best of the authors' knowledge, there are no other cases of EAH that have successfully responded to laser treatment.

### **Case 1**

A 38-year-old man presented with an erythematous lesion on his left foot, which had developed over